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PRECIS G 5.

VICKERS G.O. GUN -- OBSERVER -- NO. 1 MARK I.

GENERAL DESCRIPTION:

Weight of gun, complete with sights and deflector bag	20½ lbs.
Overall length of gun, with flash eliminator	40 inches.
Length of barrel	20 inches.
Rifling	Left hand.
Number of grooves	5
Bore	.303 inches.
Rate of fire (approximate)	950 rounds per min.
Capacity of magazine	100 rounds.
Weight of magazine (empty)	5½ lbs.
Weight of magazine (full)	11 lbs.

Marks:

No. of gun right side of the body.

No. of barrel on top of the collar at breech end of barrel.

No. of breech block left hand side of breech block.

Types of gun:

No. 1 Mk. I Spade grip (air) - 950 r.p.m.

No. 2 Mk. I Shoulder butt (ground) 950 r.p.m.

No. 3 Mk. I Bowden Cable for turret (air) 950 r.p.m.

No. 4 Mk. I & II Gas Plug (ground) 750 r.p.m.

NAMES OF PARTS.

THE STATIONARY PORTIONS.

Barrel Group:

- (a) Barrel.
- (b) Flash Eliminator.
- (c) Foresight Braaket.
- (d) Gas Block with Spigot.
- (e) Gas Plug with Port.
- (f) Rear Sight Bracket.
- (g) Magazine Catch (Front) & Spring.
- (h) Collars.
- (i) Cartridge Rim Stops.

Body and Gas Cylinder:

- (a) Body.
- (b) Piston Stops, Top and Bottom.
- (c) Gas Cylinder.
- (d) Magazine Catch (Rear).
- (e) Magazine Catch (Rear) Lever and Spring.
- (f) Locking Shoulder.
- (g) Ejector.
- (h) Ejector Cover.
- (i) Barrel Strap with Locking Grooves.
- (j) Barrel Strap Bolt and Nut.
- (k) Deflector Catch Bracket.
- (l) Body Extension Securing Pins.
- (m) Body Extension Retaining Plungers and Spring.
- (n) Cocking Handle Slide.
- (o) Cocking Handle.
- (p) Cocking Handle Catch and Spring.
- (q) Cocking Handle Lug and Pin.
- (r) Return Springs, two in number.
- (s) Return Spring Rod with Collar.

Body Extension:

- (a) Body Extension.
- (b) Spade Grip with Screws.
- (c) Spade Grip Side Panels with Screws and Nuts.
- (d) Safety Catch Thumb Piece.
- (e) Safety Catch, Spring, Plunger and Plunger Guide.
- (f) Piston Buffer.
- (g) Piston Buffer Spring and Screw.
- (h) Trigger.
- (i) Trigger Axis Pin.
- (j) Trigger Rod, with Lug and Trigger Spring.
- (k) Trigger Rod Spring Cap & Sleeve.
- (l) Sear with Lug.
- (m) Sear Spring.
- (n) Sear Axis Pin.
- (o) Sear Catch with Projections.
- (p) Sear Catch Spring.
- (q) Sear Catch Axis Pin.
- (r) Sear Buffer Plunger.
- (s) Sear Lever.
- (t) Sear Lever Axis Pin.
- (u) Sear Buffer Spring.
- (v) Sear Buffer Spring Sleeve and Plug.

Deflector and Bag:

- (a) Frame.
- (b) Catch and Spring.
- (c) Baffle Plate.
- (d) Hinge Brackets and Pin.
- (e) Deflector Bag and Catch.
- (f) Deflector Bag Stiffener.

Magazine, No. 2, Mk. I., 100 rounds capacity.

- (a) Bottom Plate & Band.
- (b) Front Catch Plate.
- (c) Rear Catch Plate.
- (d) Moveable Lip.
- (e) Spring Catch.
- (f) Cartridge Retaining Spring.
- (g) Cartridge Head Guide Ring.
- (h) Bullet Guide.
- (i) Cylinder.
- (j) Centre Post.
- (k) Top Plate.
- (l) Separators.
- (m) Mainspring.
- (n) Mainspring Hub.
- (o) Mainspring Anchorage.
- (p) Top Plate Cover.
- (q) Inspection Cover.
- (r) Follower
- (s) Loading Lever.
- (t) Securing Plate.
- (u) Top Plate Retainer.

THE MOVING PORTIONS.

Breech Block.

- (a) Breech Block.
- (b) Firing Pin.
- (c) Firing Pin Spring.
- (d) Firing Pin Screw.
- (e) Feed Piece.
- (f) Feed Piece Axis Pin, Spring, and Plunger.
- (g) Extractor.
- (h) Extractor Spring.
- (i) Locking Shoulder.
- (j) Ejector Cam Groove.
- (k) Ejector Slot.

Piston.

- (a) Piston.
- (b) Piston Bent.
- (c) Piston Projection.
- (d) Breech Locking Cams.
- (e) Return Spring Housing.
- (f) Cocking Handle Lug Slot.
- (g) Shoulders.
- (h) Piston Bearings.
- (i) Piston Head and Rings.

SEQUENCE OF STRIPPING.

- (a) See that the gun is unloaded.
- (b) Remove deflector bag and deflector.
- (c) Remove the spade grip complete with body extension.
- (d) Remove the return springs and rod.
- (e) Remove the piston and breech block.
- (f) Separate breech block from piston.
- (g) Dismantle breech block.
- (h) Remove flash eliminator.
- (i) Remove barrel strap.
- (j) Withdraw barrel group from the body.
- (k) Separate gas cylinder from the barrel.
- (l) Remove the gas plug.
- (m) Remove ejector.
- (n) Dismantle cocking handle.

SEQUENCE OF ASSEMBLING

- (a) Reverse the above procedure.
- (b) When replacing the ejector, insert the rear end inside the body.
- (c) Before inserting the gas plug into the gas block, ensure that the port is flush.
- (d) Ensure that the breech block is forward on its projection on the piston when inserting the group into the body.
- (e) Insert the end of the return spring rod into the buffer when replacing the body extension.

STRIPPING THE COMPONENTS.

Dismantling the Spade Grip. (Mk. I, No. 1 gun only.)

- (a) To remove the safety catch complete, take out the top securing screw of the side-pieces.
- (b) Remove the safety catch, plunger, spring and plunger guide from the thumb-piece.
- (c) The side-pieces are not to be removed unless damaged.

Dismantling the Body Extension.

- (a) Remove the sear release unit if fitted.
- (b) Drive out the axis pin of the sear catch and remove the catch.
- (c) Drive out the axis pin of the trigger and remove the trigger complete with trigger rod, spring sleeve and cap, sear spring and sear catch spring.
- (d) Drive out the trigger rod pin and remove the components detailed above from the trigger rod.
- (e) Drive out the pin and unscrew the plug from the sear buffer spring sleeve; remove the sear buffer plunger and spring.
- (f) Drive out the axis pin and remove the sear lever.
- (g) Drive out the axis pin and remove the sear.
- (h) Drive out the pin and remove the buffer spring screw; remove the buffer and spring.

Removal of the Front Magazine Catch.

- (a) Take out the split pin and remove the catch complete with spring.

Removal of the Rear Magazine Catch.

- (a) Drive out the securing pin, unscrew the plug and remove the spring.
- (b) Drive out the securing pin and remove the lever axis pin.
- (c) Remove the magazine catch and lever.

Removal of the Locking Shoulder.

- (a) Drive out the pin and drive out the locking shoulder.

Reassembling the Gun.

- (a) Reverse the above procedure.
- (b) When reassembling the safety catch ensure that the slots in it are towards the underside.
- (c) When reassembling the spade grip on to the body extension set the safety catch to F.
- (d) Ensure that all parts are complete and split pins in position.

To exchange the Barrel.

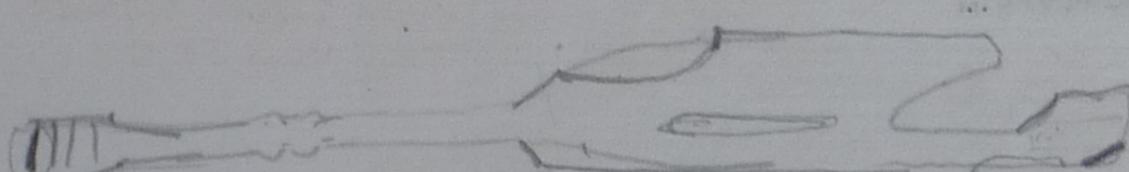
- (a) Remove the magazine if in position.
- (b) Take out the bolt and remove the barrel strap.
- (c) Withdraw the barrel from the body taking care to see that the gas cylinder is not inadvertently removed.
- (d) Reassemble in the reverse order.

Dismantling and Reassembling the Magazine.

- (a) Take out the retaining pin and release the tension from the main spring.
- (b) Prise outward the top plate retaining spring clips with drill cartridges and remove the top plate and bullet support with platform and spring from the magazine body.
- (c) Remove the bush with lever from the top plate.
- (d) Reassemble in the reverse order taking care to place the platform of the bullet support in the lip of the magazine body, and engage the bush and main spring. Place the top plate on the magazine with the longer arm of the lever just to the left of the front catch plate.

LIST OF TOOLS USED FOR STIPPING.

TOOL	USE
Combination Spanner	Removing and replacing the flash eliminator, barrel strap nut etc. Removing the gas plug port.
Gas Plug Spanner.	Removing and replacing gas plug.
Extractor tool.	Removing the extractor spring.
Clearing Plug.	Removing the separate cases.
Winding Plate.	To hold the magazine when applying or releasing the spring tension.



MECHANISM.

To Load the Gun:

1. (a) Put safety catch to "safe."
- (b) Pull back Cocking Handle to the rear to cock gun and return cocking handle to its forward position.
- (c) Place magazine (rear catch first) in position on the body and give an upward pull to ensure security.
- (d) Set the safety catch to "Fire."

The gun is now loaded and ready to fire.

Safety Catch, Mark I.

2. The safety catch is operated by a small knurled thumbpiece which also pivots on the upper side piece screw. The thumb-piece is semi-circular in shape, hollow, and has a projection near its axis, to which a plunger is pinned. The letters S and F are engraved upon the thumbpiece. The safety catch is connected to the thumbpiece by the plunger which passes through a plunger guide pivoted on trunnions in a slot in the catch. The spring presses between a shoulder on the plunger and the plunger guide and ensures that the catch is retained in the safe or fire position.

Cocking by Hand.

3. (a) On the cocking handle being pulled backwards, the Cocking Handle Catch is disengaged from the recess in the Body and allows the cocking handle to be drawn to the rear. The Cocking Handle Lug engages against the rear of the slot in the left side of the Piston. The Piston is thus drawn to the rear, carrying with it the Breech Block, until the Bent on the underside of the Piston is engaged by the Sear. During this movement of the Piston, the Return Springs are compressed. The Cocking Handle must now be returned to its forward position.

The gun is now ready to fire.

Forward Movement.

4. (a) Release of the Sear: When the trigger is pressed, the short arm forces the trigger rod forward and compresses the trigger rod spring. The forked forward end of the trigger rod, being engaged against the lower arm of the sear, rotates the sear on its axis pin, compressing the sear spring and withdrawing the nose of the sear from the bent on the underside of the piston. Meanwhile, the head of the sear catch has been forced forward by the sear catch spring until its two projections have been engaged over the lug on the sear, thus preventing the sear from rising until the trigger has been fully released. When the nose of the sear is disengaged from the bent on the piston, the piston is forced forward by the compressed return springs, carrying with it the breech block.

4. (b) Feeding of the Round from Magazine to Chamber.

As the Breech Block moves forward, the Feed Piece engages against the base of the cartridge held in the lips of the Magazine, forcing the bullet end of the cartridge under the front of the bullet lead and Feed Piece Cam, guiding the bullet into the Chamber and there deflecting the base of the cartridge downward on to the face of the Breech Block where it is engaged by the Extractor. The final forward movement of the Breech Block forces the cartridge fully home into the Chamber.

(c) Action of the Magazine.

Immediately each cartridge is clear of the lips of the Magazine, the remainder of the cartridges in the magazine are moved round bodily by the action of the main Spring acting on the Top Plate until the next round is positioned in the Magazine Lips ready for the next feed action.

(d) Locking of the Breech Block.

When the Breech Block reaches the end of its forward movement, the Piston continues to move forward and the lower cam on the rear of the Piston bears against the corresponding inclined surface on the rear of the Breech Block, forcing the rear of the Breech Block up until it engages in front of the Locking Shoulder in the body. The Piston still continues to move forward, and the horizontal surface at its rear bears against the underside of the Breech Block, thus retaining the Breech Block in its locked position, in front of the Locking Shoulder.

(e) Firing the Cartridge:

During its final forward movement, the front of the Piston Projection strikes the Firing Pin, forcing it forward and compressing the Firing Pin Spring; the nose of the Firing Pin protrudes through the firing pin hole in the face of the Breech Block and strikes the cap of the cartridge in the Chamber. The Piston finally comes to rest against the Piston Stops on the body.

Backward Movement.

5. (a) Action of the Gases:

On the cartridge being fired, and after the bullet has passed the gas vent in the Barrel, a portion of the gases escape through the vent into the Gas Block and is deflected by the groove in the Port into the gas cylinder, where it impinges on the head of the Piston, driving the Piston to the rear, and compressing the Return Springs.

(b) Backward Movement of Piston and Unlocking of the Breech.

As the piston is driven to the rear, the front of the Piston Projection is disengaged from the rear of the Firing Pin, which is withdrawn by the firing pin spring. At the time the horizontal surface at the rear of the Piston is still bearing against the underside of the rear of the Breech Block ensuring that the Breech Block remains in the locked position until the bulk of the gases have escaped from the barrel. As the Piston moves further to the rear, the upper cam on the rear of the Piston Projection bears against the corresponding inclined surface inside and at the rear of the Breech Block, forcing the rear of the Breech Block down, and out of engagement with the Locking Shoulder. The Piston now carries the Breech Block to the rear until the piston is brought to rest against the Piston Buffer on the body extension.

(c) Extraction and Ejection.

As the Breech Block moves to the rear, the Claw of the Extractor being engaged in front of the rim of the empty case in the Chamber, withdraws the empty case. The Cam Groove on the left of the Breech Block now bears against the tail of the Ejector, rotating the Ejector on its Trunnions and forcing the nose of the Ejector inwards into the slot at the front of the Breech Block, where it engages behind the base of the empty case held by the Extractor. The empty case is then jerked out of engagement with the Extractor, through the Ejection opening on the right side of the body through the Deflector into the Deflector Bag.

During the backward movement of the Breech Block the Feed Piece is forced down by the round held in the lips of the Magazine. As soon as the Feed Piece is clear of this round it rises under the influence of the Feed Piece Spring and Plunger to its normal position.

(d) Engagement of the Sear.

When the trigger is released, the Trigger and Trigger Rod are forced back to their normal positions by the Trigger Rod Spring, thus freeing the forked end of the Trigger Rod from the lever arm of the sear.

The Sear, however, is still unable to rise until the Trigger Rod has almost reached the limit of its backward movement, when two small lugs on the Trigger Rod bear against the Sear Catch and rotate it to the rear, disengaging the two projections of the catch from the lug on the rear of the Sear. The sear is now forced up into its normal position by the Sear Spring. The Sear is now free to engage in the bent on the Piston as the Piston commences its forward movement. The shock of the impact between the Sear and the Piston bent is absorbed by the Sear Buffer Spring, through the medium of the Sear Lever, and Sear Buffer Plunger.

MISCELLANEOUS.Firing Action.

1. Assuming the gun to be loaded, if the trigger is pressed and the pressure maintained, the gun should continue to fire until either the trigger is released or the last round is fed from the magazine.

To Unload the Gun.

2. (a) With the palm of the hand, press forward the Rear Magazine Catch Lever, and with the fingers of the same hand grasp the leather handle and lift the magazine, rear end first, from the gun.

(b) If the breech block is held to the rear, press the trigger; pull back cocking handle and return to forward position; press trigger, or

(c) If the breech block is in the forward position, pull back cocking handle and return to the forward position; press trigger.

The gun is now unloaded.

Action of the Safety Catch.

3. (a) On rotating the safety catch thumbpiece to the "safe" position, the safety catch is lowered and engages with the stop on the trigger, thus preventing movement of the trigger.

When rotated to the "fire" position, the safety catch is raised clear of the trigger, allowing free movement.

NOTE: The action of applying the "safety catch" does not prevent the gun being cocked.

Safety Arrangements:

4. The gun cannot be fired until after the breech has been locked for the following reasons:
 - (a) The design of the mechanism is such that the piston must raise the rear of the breech block in front of the locking shoulder before it can move forward independently to strike the firing pin.
 - (b) If the breech block is not raised, the piston will jam.
 - (c) The firing pin is retained within the breech block by its spring until it is struck by the piston.

(d) Safety catchLoading and Unloading the Magazine.5. To Load the No. 2, Mark I Magazine:

- (1) Ensure that there is no tension on the main spring and disengage the retainer.
- (2) Ensure that the securing plate of the loading lever is properly engaged in the groove in the centre post.
- (3) Ensure that the follower is visible through the lips and that the hooked end of the loading lever coincides approximately with the front catch plate.
- (4) Invert the magazine and place it on the loading post.
- (5) Release the movable lip.
- (6) Hold the magazine with the left hand and take the ammunition in the right hand.
- (7) Insert a round in the lips and press it into the magazine.
- (8) Rotate the top plate of the magazine with the fingers of the left hand, until the round is clear of the lips and the next space is visible.

5. To Load the No. 2 Mark I Magazine (Continued);

- (9) Repeat operations (7) and (8) until the magazine is full,
- (10) Ensure that no spaced, otherwise stoppages may result,
As a check upon loading it is a good plan to have the
ammunition arranged in batches of 100 rounds,
- (11) Replace the movable lip and ensure that it is properly
engaged by the spring catch,

6. To Tension the Main Spring;

- (1) Place the magazine on the tensioning plate and bring the hooked end of the loading lever over the rear catch plate,
- (2) Engage the winding handle with the loading lever of the magazine,
- (3) Steady the magazine and rotate the winding handle in a counter-clockwise direction until the maximum tension has been applied to the spring. Engage the retainer in the first slot below the position of the maximum tension, taking care to ensure that the retainer is not forced into engagement if it coincides with a slot at maximum tension,

7. To Remove the Tension from the Main Spring;

- (1) Place the magazine on the tensioning plate and engage the winding handle with the loading lever of the magazine,
- (2) Take the weight of the spring and disengage the retainer,
- (3) Ease back the winding handle until the tension is removed and if the magazine is not to be unloaded, replace the retainer;

8. To Upload the No. 2 Mark I Magazine;

- (1) Remove the tension from the main spring,
- (2) Release the movable lip,
- (3) Rotate the top plate, when the rounds will fall out,

STOPPAGES AND IMMEDIATE ACTION1. Stoppages.

(a) The chief stoppages are primarily due to such defects as faulty ammunition, empty or defective magazine, short or broken firing pin, defective extractor or spring, defective feed piece, defective ejector, miss feed and excessive friction. Stoppages can be reduced to a minimum by the careful observance of maintenance instructions.

(b) The position of the rear end of the piston, as viewed through the cocking handle slot, or the position of the cocking handle when drawn to the rear to engage the piston will indicate the action which must be taken to clear a particular stoppage.

NOTE: The cocking handle must be drawn back carefully to feel the position of the piston.

The positions of the piston are as follows;

First Position; Rear end of piston below the rear magazine catch lever. Cocking handle fully forward.

Second Position; Rear end of piston to the rear of the rear magazine catch lever. Cocking handle to the front of the rear magazine catch lever.

Third Position; Rear end of piston not visible. Cocking handle below or to the rear of the rear magazine catch lever.

2. Immediate Action.

(a) Immediate action is the immediate application of a probable remedy for a stoppage, based on the position of the piston and the condition of the gun. It must not be considered complete until the gun is again functioning satisfactorily. The immediate action table is set out to give a clear indication of the nature and cause of each stoppage and the probable remedy.

(b) The type and number of stoppages which can be cleared in the air will depend on the installation and the spare parts carried in the aeroplane.

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IMMEDIATE ACTION TABLE.

Position of Rear End of Piston: First.

Immediate Action:

Cock the gun. Fire and watch the top plate of the magazine.

<u>Result.</u>	<u>Cause.</u>	<u>Remedy.</u>
(1) Gun fires.	(1) Miss fire due to defective ammunition.	Nil.
(2) Gun fires, but repeats stoppage.	(2) No feed due to: (i) sluggish magazine. (ii) Incomplete backward movement due to: (a) Friction, dirt, or chips. (Note- (ii) (a) may also give a stoppage in the second position.) (b) Fouling in the gas block or gas plug port.	(2) (i) Change magazine. Continue firing. (ii) Cock the gun sharply and fire. If stoppage is repeated, remove Magazine, clear gun, wipe away any brass chips which are visible and oil the piston rod through the feed-way in the body. Replace magazine and continue firing. (b) Correct mainentance of gun.
(3) Top plate rotates <i>Gun does not fire.</i>	(3) Defective firing pin.	(3) Remove magazine. Clear gun. Change breech block. Replace magazine and continue firing.
(4) Top plate does not rotate, and gun does not fire.	(4) No feed due to: (i) Empty magazine. (ii) Defective or dirty magazine.	(4) (i) Change magazine. (ii) Change magazine. Correct maintenance of magazine.
(5) Stoppage repeated after changing magazine in (4)	(5) Defective feed piece or feed piece spring.	(5) Remove magazine. Change breech block. Replace magazine and continue firing.

Position of Rear End of Piston: Second.

<u>Immediate Action</u>	<u>Result.</u>	<u>Cause.</u>	<u>Remedy.</u>
Cock the gun. Remove the magazine.			
A. If a round is jammed in the lips, change the magazine and continue firing.	Gun fires.	Defective magazine.	Correct maintenance of magazine.
B. If a round is correct in the lips, clear the gun. Empty deflector bag. Replace magazine and continue firing.	(1) Gun fires. (2) Gun repeats stoppage	(1) Full deflector bag. (2) Separated case.	(1) - - - - - (2) Remove magazine. Clear gun, using clearing plug to remove separated case from the chamber. Replace magazine and continue firing.

IMMEDIATE ACTION TABLE
(Continued)

Position of Rear End of Piston: Third.

<u>Immediate Action.</u>	<u>Result.</u>	<u>Cause.</u>	<u>Remedy.</u>
Cock the gun. Remove the magazine.			
A. If there is no round in the body or chamber, change the magazine and continue firing.	Gun fires.	Defective magazine.	Correct maintenance of magazine.
B. If live round only is in body, clear gun. See that round is correctly positioned in magazine lips. Replace magazine and continue firing.	Gun fires.	Point of bullet misses chamber usually because the first round was out of place in the lips before the magazine was put on the gun.	Care in stowage during transport and in fitting to stowage pegs in aeroplane.
C. If empty case is on face of breech block, clear gun. Change ejector. Replace magazine and continue firing.	Gun fires.	Defective ejector.	
D. If empty case is in chamber, clear gun. Replace magazine and continue firing.	(1) Gun fires. (2) Gun fires but repeats stoppage.	(1) Defective ammunition. (2) Defective extractor or extractor spring.	(1) Nil. (2) Remove magazine. Clear gun. Change breech block, replace magazine and continue firing.

- 1. Release of seat.
- 2. Action of feed.
- 3. Action of mag.
- 4. Action of b.b.
- 5. Firing stage.

Action of gun
Rel. of seat
Action of b.b. & piston

Action of gun
B. action of b.b.
Rel. of seat

Rel. of seat
Rel. of seat
Action of gun
Action of b.b.
Rel. of seat
Firing stage



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